ESTIMATES OF DIRECT COST OF UNDERGRADUATE INSTRUCTION AT THE UNIVERSITY OF THE PHILIPPINES[1]

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The study presents a methodology for calculating the direct cost of undergraduate instruction, and applies this methodology in estimating the cost of undergraduate instruction at the University of the Philippines. Unlike previous studies made on the topic, this study explicitly considers the cost of facilities (i.e., existing library holdings, computer, teaching and research laboratories) in the estimation and finds that this cost comprises a material component approximately 25% of total direct cost of undergraduate instruction at the University of the Philippines.

I. INTRODUCTION AND SIGNIFICANCE OF THE STUDY

Despite the dismay and outrage felt throughout the UP community when the University's budget was cut in 2001, there is a growing sentiment worldwide that higher education institutions must reduce their dependence on the public purse. The reasons for such are compelling and extensively discussed in a number of articles.[2] Among these are expected efficiency and quality gains from increased reliance on 'market forces', the greater social benefits derived from public sector investments in basic and secondary education, and the diseconomies resulting from a general subsidy for public tertiary education. The message is clear: students must shoulder an increasing share of the cost of higher education.

Together with the initiative to review the tuition fee structure of UP in the light of the foregoing, a calculation of the current costs of educating a UP student is therefore an imperative. This is the impetus of the present study.

II. RESEARCH OBJECTIVE

This study proposes a methodology for the estimation of direct costs of undergraduate instruction at UP and to develop initial estimates based on the methodology.

III. REVIEW OF LITERATURE

The literature on developments in higher or tertiary education in the last two decades documents an increasing global trend to shift part of the financing burden for higher education from the public to the private sector. Many countries, developed (such as the U.S. and Australia) as well as developing (such as Argentina, India, the Philippines, and a number of African states), have adopted a policy of reduced direct public spending for higher education. The rationale for such a move is principally economic. It

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is a result of evidence that (1) private returns to tertiary education are significant and likely outweigh its public benefits, (2) public higher education institutions (HEIs) are generally less efficient than their private counterparts, (3) many public HEIs tend to 'distort' the market for tertiary education by competing in the same areas and fields in which private institutions operate, and (4) a general subsidy for public tertiary education is inequitable in that government resources are equally enjoyed by those who do not really need it as well as by those who do.

For developing countries in general, and the Philippines in particular, the reduction of financing support for higher education was also induced by severe fiscal constraints and a need to direct resources to improve the quality of basic and secondary education in the country. Major reviews of the Philippine education system undertaken in the 1990s led to the adoption of tighter rules in the establishment of public HEIs as well as initiatives to curb costs by rationalizing the HEIs' budgets and improving the latter's efficiency. At the macro level, government reined in the budget for higher education in the country beginning the late 1990s, keeping it relatively flat[3] despite increasing enrolment in public HEIs.

Two recent initiatives to calculate the cost of higher education instruction in the Philippines are Santiago et al (2002) for the Commission of Higher Education and Tan (2003)[4].

The stated objective of Santiago is to develop and pilot a research methodology to estimate the costs of different degree programs offered in higher educational institutions (HEI) (measured as cost per student per degree). The study is part of an attempt to move towards the use of a normative financing formula in determining budget allocations for state universities and colleges (SUCs).

To arrive at a cost per student per degree, costs were divided by the study into direct and indirect costs. Direct costs referred to "teaching expenses for personnel services and maintenance and other operating expenses (MOOE) of the department offering the degree." Indirect costs referred to "research, extension services, and administrative costs of running the entire HEI"[5] (see Exhibit A for the conceptual framework of the Santiago study).

Since courses taken varied depending on the degree pursued, the study computed faculty cost per student per subject by dividing faculty compensation relating to undergraduate teaching[6] first by the number of sections of a course the faculty member taught for a test year, then by the number of students in each class, and finally by the number of units the course is equivalent to. This procedure is repeated for each faculty member of the department. If more than one faculty member taught a specific subject, the cost per student per subject is arrived at by getting the average for all faculty members who had taught the subject. Using the curriculum of a program, costs per student per subject were then added to arrive at faculty (teaching) cost per student per degree program.

All non-faculty costs incurred at the department and at the university levels were divided by number of students to arrive at a (non-teaching) cost per student per year.[7] This figure was multiplied by the number of years it takes to finish a degree program and then added to the faculty (teaching) costs of subjects needed for the program to arrive at total cost per student per degree. Santiago used this methodology to compute the cost per student of a number of degree programs offered by, and using data from, one private and one public HEI.

Tan simplified the Santiago methodology to a great extent by computing direct cost per subject based on the college/unit of origin. Direct costs in Tan consisted of faculty compensation (based on the college's internal operating budget) and part of the college's MOOE budget. Instead of computing direct cost separately for each subject, Tan

computed direct costs per college/unit and uses the latter to derive a cost for all courses taken by a student from that college/unit to complete his degree program.

Moreover, Tan included only the laboratory and library components of MOOE as part of direct cost. For both faculty compensation and lab/lib MOOE, the study used only the portion of cost that is attributable to instruction by considering the ratio of instruction to total faculty load.[8] Instead of computing a cost per student, Tan computed a cost per student credit by dividing total direct costs by the weighted sum of student credits of all courses offered by a college (see Exhibit B for the Tan model).

Santiago computed faculty cost per subject using the compensation of each faculty member who taught the subject and the number of classes taught by each faculty member for the chosen school year. As Tan pointed out, this procedure does not take into account the fact that faculty are hired to teach a mix of courses. The consideration of faculty cost in the model should thus be at a higher level of aggregation. Tan improved on the Santiago methodology by using the academic units from which a course originates as the cost object, rather than each subject in the curriculum of a student.[9]

Further, Tan did away with the use of number of classes as an allocation base for faculty cost. Number of classes is a less important measure of output than student credit units (SCU). It is also a less objective and comparable output measure since the number of classes during a semester depends, among others, on management policy regarding class size. SCU is not only more objective, it also has a more direct relationship with revenue flows. The use of specific faculty and specific number of classes taught by each faculty in Santiago confounds the estimation process and adds unnecessary complication.

However, Santiago and Tan did not consider the cost of existing facilities used for undergraduate instruction in their cost estimates. Both studies limited their consideration of costs to a university's current operating expenditures (COE). COE do not include the cost of the fixed assets and of existing holdings, both of which are necessary inputs to the instruction process.

IV. STUDY LIMITATIONS

Instruction is a high fixed cost activity. In any cost estimation attempt, numerous cost allocation decisions need to be made. The appropriate allocation bases and procedures for estimation may differ depending on the intended use of the cost information. There is also a tradeoff involved in the choice of allocation base since data for some allocation bases that may produce more accurate cost estimates are more difficult and costlier to collect. The cost of more extensive information gathering and processing that is needed by better cost estimates must thus be carefully evaluated against the benefits expected to be achieved.

The identification of a "most appropriate" allocation base is therefore a contentious process.

A university has functions, namely research and extension, which complement instruction. These other functions, together with administration activities, result in significant indirect costs for instruction. The consideration of indirect costs of instruction is left to the next phase of this study.

To the extent possible, this study uses secondary data generated by the university's existing information systems. This limitation is imposed by the present study's time and resource constraints.

V. METHODOLOGY

Definitions

This study considers the university's three main functions of instruction, research, and extension as its ultimate cost objects. Consequently, all costs of the university can be classified under any of these three groupings. Activities that contribute to the completion of a student's program of study are considered as related to instruction. Thus, the cost of research laboratories that a student uses to complete a project that is required by his/her program is part of cost of instruction. The compensation of personnel who reproduce classroom materials, handle the students' academic records, maintain the classrooms and laboratories, and undertake similar activities is also considered part of the cost of instruction. If a resource is used for two or more functions, an allocation procedure is undertaken to distribute the cost of the resource.

In this study and as defined in management accounting textbooks, direct costs are costs that can be traced in a feasible manner to an identified cost object. All other costs related to the cost object but cannot be traced feasibly to it are considered indirect. Thus, if one can determine the amount of resources consumed for a cost object in a feasible manner, then this cost is direct with respect to the said cost object.

The classification of costs as direct or indirect is a dynamic process. If information collection and processing costs decline, or if the benefits of more accurate cost estimates are large enough, then a cost may be reclassified as direct because now the effort to trace the cost object's consumption of that particular resource has become worth it.

Conceptual Framework

Following Tan (2003), the cost object of specific interest in this study is instruction at each academic unit. The University's accounting and budgeting system accumulates the costs of each academic unit. Since the University also collects faculty load data that can be used to allocate an academic unit's costs among the three functions, then the costs of an academic unit can be argued to be traceable in a feasible manner to each of the three functions, including instruction. Once a cost of instruction for each academic unit is determined, it is a simple matter, again using the methodology proposed by Tan (2003), to calculate the direct costs of a degree program.

Thus, all costs presently reported by the university's accounting and budgeting system as incurred by an academic unit are direct costs of instruction, research or extension. These direct costs are personnel services (faculty, administrative and research staff), MOOE (regular MOOE, janitorial, utilities, security), and laboratory and library expenditures. The share of undergraduate instruction in these costs is determined using the ratio of undergraduate instruction to the total load (i.e., instruction + research + extension) of the faculty.[10]

Direct costs also include the cost of facilities used for undergraduate instruction. Facilities are fixed assets such as libraries, computer and research laboratories that a university needs to make available to students as these are used by the latter to comply with and complete certain requirements of their programs of study. As these facilities have useful lives beyond one year, an allocation procedure will be undertaken in order to determine the facilities' annual cost.

A representation of the study's conceptual framework is shown in the next page.

REPRESENTATION OF CONCEPTUAL FRAMEWORK

Level of Cost Accumulation	Types of Costs	
	Indirect[11]	Direct
University System	administration costs[12]	
	PLUS	

Autonomous Campus	costs of student services
	  e.g., sports, medical,
	  admission, registration
	
	costs of campus-level research
	  and extension activities
	
	administration costs	

	PLUS	

Academic Unit[13]	costs of unit-level
	research & extension activities
		costs of instruction
		  personnel services
		  MOOE
		  annualized cost of facilities
		  laboratory & library

	EQUALS	
	TOTAL ANNUAL INDIRECT COSTS OF INSTRUCTION	TOTAL ANNUAL DIRECT COSTS OF INSTRUCTION ÷ total SCU for the year
	EQUALS	
		DIRECT COST OF INSTRUCTION per SCU OF THE ACADEMIC UNIT

The Estimation Model and Procedures

The estimation model is as follows:

$$DC(I)_{i,t} = \frac{PS(I)_{i,t} + MOOE(I)_{i,t} + AFC_{i,t} + LLE(I)_{i,t}}{TSCU_{i,t}}$$

where: i = academic unit i in an autonomous campus

   t = year[14]

and

DC (I) = direct cost of undergraduate instruction

PS (I) = cost of personnel services attributable to undergraduate instruction

   = annual personnel services cost x ratio of undergrad instruction to total faculty load, excluding administration[15]

MOOE (I) = maintenance and other operating expenses attributable to undergraduate instruction

   = MOOE x ratio of undergrad instruction load to total faculty load, excluding administration

AFC = annualized cost of facilities used for undergraduate instruction

LLE (I) = laboratory and library expenses attributable to undergraduate instruction

   = laboratory and library expenses x ratio of undergrad instruction load to total instruction load[16]

TSCU = total student credit units of the academic unit for the year

$$= \sum_{a=1}^{n} x_a u_a$$

   x = number of students enrolled in class a

   u = number of credit units of class a

   n = number of classes offered by the campus

AFC refers to the annualized cost of *existing* library holdings, computer laboratories, other teaching/research laboratories that are used by undergraduate students to complete their program requirements as identified by the respective units. This is differentiated from LLE which represents the actual *current* expenditure of the unit for its library and laboratory facilities.

There are two options in the estimation of the annual cost of facilities: 1) Use acquisition cost of facilities;[17] and 2) Use the replacement cost of facilities.

Acquisition cost data are already collected by the University's accounting system. Whether acquisition or replacement cost is used, facilities must be classified and the useful life per classification determined.[18] Annual cost is calculated by dividing total cost by useful life in years. If the facility is used for other purposes (e.g., a laboratory is used both by graduate and undergraduate students), then the amount attributable to undergraduate instruction is determined by apportioning the annualized cost among its uses (the method used for allocating personnel services and MOOE described previously may be used).

Acquisition cost has the advantage of ready availability and objectivity. However, acquisition cost will not produce current estimates of cost of instruction especially if most of the assets had been acquired many years ago and/or their prices have significantly changed since their acquisition. Use of replacement cost will cure this important defect, but replacement cost requires periodic primary data gathering and the use of judgment by the one doing the estimation.

The present study is able to use replacement cost in the estimation of cost of

instruction as this information was available.[19] However, future initiatives to estimate cost of instruction may have to rely on acquisition cost of facilities given the ready availability of the latter.

Data sources

Cost of personnel services and MOOE are based on the internal operating budgets of each of the academic units. The annual budgets of the units for laboratory and library expenditures are obtained directly from the Accounting Office, as these expenditures are paid out of trust funds. Faculty load and enrolment data are obtained from the Office of the Vice Chancellor for Academic Affairs and from the Office of the University Registrar, respectively. Acquisition costs of facilities are available from the Supply, Property and Maintenance Office, while the acquisition costs of library holdings are available from the University Library.

V. FINDINGS

Tables 1A and 1B present the estimates of direct costs of undergraduate instruction at each of the autonomous campuses of the UP System, except for the Open University. The proportion of faculty time spent on undergraduate teaching varies from campus to campus, with Diliman and Los Banos having the lowest at 63% and Mindanao and Baguio the highest at 76%. Faculty cost per student credit unit is the largest component of direct cost for all the campuses, except for Mindanao. For the latter, the annualized cost of facilities takes the lion's share of its direct costs. This is not unexpected given the small size of enrolment of the campus. Total direct cost of undergraduate instruction per SCU is lowest in UP Baguio at just over P1,000 per SCU, and is highest in UP Mindanao at almost P2,250 per SCU. The average direct cost of undergraduate instruction per SCU for the UP System, excluding the Open University, is P1,531.88 per SCU. Faculty and facilities costs constitute 37% and 25% of total direct cost, respectively. The significance of facilities cost as a component of total direct cost of instruction (COI) implies that the exclusion of this in previous estimates of COI materially underestimates the latter.

Table 2 presents the estimates of direct cost of undergraduate instruction for selected academic units of UP Diliman. The basis of selection is the availability of complete data for cost estimation. The variability in the proportion of faculty time spent on undergraduate instruction is greater among academic units than among autonomous campuses. Faculties of the College of Business Administration and the National College of Public Administration and Governance spend the lowest proportion of their time for undergraduate teaching at 31%, while the faculty from the College of Engineering spends the highest at 85%.

Together, personnel and facilities costs account for 94% of total direct cost based on the average for the sampled academic units, with personnel cost slightly edging out facilities at 49% of the total.[20] Among the sampled units, however, there is significant variation in their costs of undergraduate instruction. The Institute of Islamic Studies has the highest total direct cost per SCU and may be considered an outlier because of its size. Excluding this unit, the average total direct cost of undergraduate instruction of the sampled units is around P1,500 per SCU. The School of Economics and NCPAG have the highest total direct cost per SCU at P3,853.14 and P2,233.59, respectively. The lowest is the College of Social Science and Philosophy at almost P700 per SCU. Because of the study's reliance on data from the Supplies, Property and Maintenance

Office for many of the units of the College of Science, the facilities cost per SCU of this unit and consequently, its total direct COI, is understated. The low contribution of current laboratory and library expenditures to the total cost of instruction may be due to the fact that spending for these is limited to the actual collections from the students. For most of the units, the library fee charged per student has not changed in over 15 years and units have had to rely on outside funding to beef up their library holdings.

Using the university's internal operating budget as basis for COI calculations results in estimates that have both an upward and downward bias. The estimate is understated to the extent of additional spending by the university for personnel compensation and MOOE that are funded by donations and non-budgetary sources. For instance, many faculties of UP are provided with professorial chair and faculty grant awards to augment their regular salary. It is also not uncommon for some UP units to use external funding to supplement UP's budget for its library acquisitions. On the other hand, the calculations may be overstated as a result of inefficiencies and imprecise allocations. Some UP units, for example, have extensive administrative staff support for research and extension activities. The use of faculty load as allocation basis for administrative costs will result in a portion of this non-instruction administrative cost to be included in the calculated cost of undergraduate instruction.

Table 1A
Estimate of Direct Costs of Undergraduate Instruction
for UP System Autonomous Campuses

Campus	Total Student Credit Units (SCU)	Undergrad Teaching % of total load	Faculty PS/SCU	Admin Cost/SCU	Annualized Facilities Cost/SCU[21]	MOOE per SCU	Lib and Lab per SCU	Total direct cost
UP Manila 1/	125,772	69%	451.48	240.93	396.32	268.40	116.46	1,473.59
UP Los Banos	360,899	63%	517.39	242.39	158.73	94.29	44.09	1,056.89
UP Visayas	158,910	74%	641.24	475.18	340.71	142.17	35.36	1,634.66
UP Diliman	571,579	63%	546.07	325.93	534.70	185.85	72.97	1,665.52
UP Baguio	69,791	76%	358.19	133.13	294.52	125.69	89.55	1,001.09
UP Mindanao	23,327	76%	684.04	277.66	852.18	374.13	58.86	2,246.86
Total UP System	**1,310,278**	**70%**	**569.56**	**332.95**	**387.19**	**173.84**	**68.33**	**1,531.88**

1/ excludes College of Medicine and School of Health Sciences

Table 1B
Breakdown of Direct Cost of Undergraduate Instruction
of UPS Autonomous Campuses in %

Campus	Total Student Credit Units (SCU)	Undergrad Teaching % of total load	Faculty PS/SCU	Admin Cost/SCU	Annualized Facilities Cost/SCU	MOOE per SCU	Lib and Lab per SCU	Total direct cost
UP Manila	125,772	69%	31%	16%	27%	18%	8%	100%
UP Los Banos	360,899	63%	49%	23%	15%	9%	4%	100%
UP Visayas	158,910	74%	39%	29%	21%	9%	2%	100%
UP Diliman	571,579	63%	33%	20%	32%	11%	4%	100%
UP Baguio	69,791	76%	36%	13%	29%	13%	9%	100%
UP Mindanao	23,327	76%	30%	12%	38%	17%	3%	100%
Total UP System	**1,310,278**	**70%**	**37%**	**22%**	**25%**	**11%**	**4%**	**100%**

1/ excludes College of Medicine and School of Health Sciences

Table 2
Estimate of Direct Costs of Undergraduate Instruction of Selected UPD Units

Academic Unit	Faculty-Staff Ratio	SCU	% Undergrad Instruction	Cost per SCU				Total direct cost per SCU
				Personnel Cost	MOOE	Lab & Lib	Facilities	
Asian Institute of Tourism	0.50	9,639	68%	732.13	114.80	5.71	239.96	1,092.60
College of Architecture	1.85	10,829	76%	786.44	30.10	na	125.96	942.50
College of Arts and Letters 1/	4.25	100,752	78%	1,469.32	41.43	0.84	199.13	1,710.73
College of Business Administration	1.50	21,080	31%	397.28	53.95	na	703.98	1,155.22
College of Home Economics	0.81	19,711	71%	1,209.46	108.35	45.96	437.67	1,801.45
College of Mass Communications 1/	0.61	19,440	66%	872.79	102.56	17.90	194.29	1,187.55
College of Engineering	2.19	60,022	85%	915.78	156.52	16.96	573.51	1,662.76
College of Education	1.74	13,914	32%	656.37	51.53	1.51	266.93	976.33
College of Science 1/	1.81	141,468	61%	529.10	88.69	12.26	194.33	824.38
College of Social Sciences & Philoaophy 1/	2.52	93,906	65%	580.01	46.07	1.99	70.69	698.76
Inst of Islamic Studies	0.55	222	36%	7,247.40	727.65	na	9,675.68	17,650.73
Inst of Library & Info Science	1.80	4,539	57%	512.97	24.19	30.18	1,275.61	1,842.95
National College of Public Administration & Governance	0.90	8,580	31%	602.83	66.31	na	1,564.45	2,233.59
School of Statistics	2.00	9,531	33%	360.77	24.96	11.96	701.82	1,099.50
School of Economics	0.74	12,167	37%	633.92	87.55	na	3,131.67	3,853.14
Average excluding IIS	**1.66**	**37,541.29**	**56%**	**732.80**	**71.21**	**10.38**	**691.43**	**1,505.82**
Breakdown of direct costs in %				**48.7%**	**4.7%**	**0.7%**	**45.9%**	**100.0%**

1/ facilities cost data were mostly obtained from the Main Library &/or SPMO and are therefore based on
acquisition costs; na = not available

VI. CONCLUSIONS AND POLICY IMPLICATIONS

Given that the tuition fee UP presently charges its undergraduate students is at most P300/unit[22], it is evident that if the times call for students to shoulder a greater proportion of the cost of their study, a significant adjustment in tuition fees is in order. When UP last increased its undergraduate tuition fees in 1989 with the introduction of the Socialized Tuition Fee and Assistance Program (STFAP), P300/unit represented the 'full cost' of studying at the University[23]. Given the current levels of cost presented in this study, we find that the rate of increase of university costs is much higher than the rate of inflation.[24] Additional calculations show that the cost of undergraduate instruction in UP has increased at a compounded annual rate of 11%, faster than the national average inflation rate of 7%.

Our study shows that any estimate of cost of instruction cannot ignore the cost of facilities a university provides and that students use to complete the requirements of their respective programs of study. The significant contribution of facilities cost to the total COI implies that exclusion of this component severely understates COI estimates.

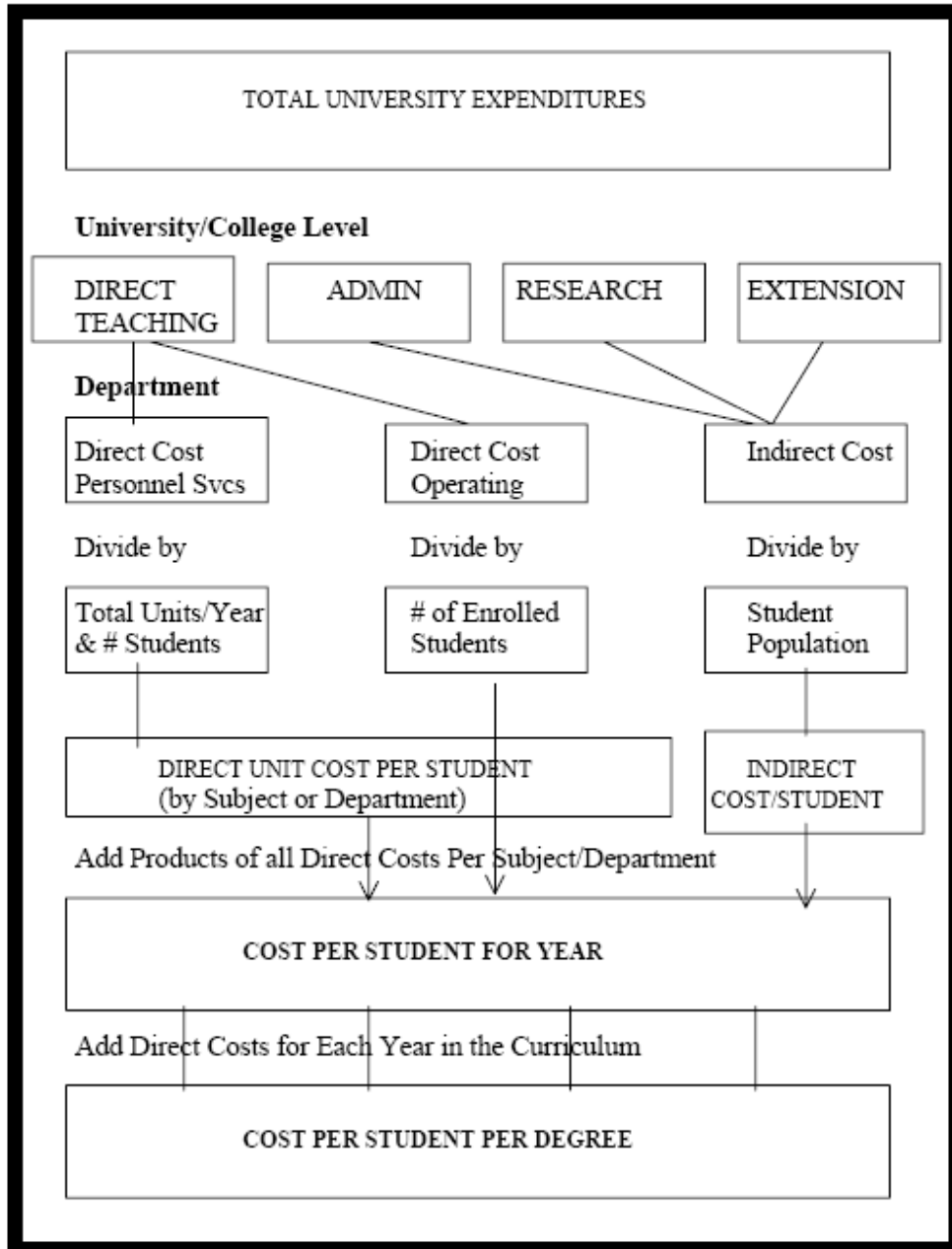The significant variation in direct COI across campuses and across academic units suggests that a uniform tuition fee policy such as that followed in UP at present results in extensive cross-subsidization among its various units and programs. Further study is called for on the possibility of a non-uniform tuition fee adjustment for some programs, especially if market conditions in the fields of study of such programs signal the acceptability of such a move.

An equally compelling area for further study is the efficiency in the use of resources at the various levels of cost incurrence in the university. One indication of differences in efficiency among the UPD units sampled is the range of faculty to staff ratios shown in Table 2. The literature surveyed in this study also propounded that publicly-financed HEIs are less efficient in many respects to their private counterparts. This issue must be analyzed and appropriate actions taken if UP intends to shift a greater burden of COI recovery to its students.

Finally, this study dealt only with direct costs of undergraduate instruction. Given the nature of indirect costs, more allocation options are available for their inclusion in COI estimates. Further study of these various alternatives is necessary to complete our picture of cost of instruction at the University of the Philippines.

Santiago et al. (2002) Conceptual Framework: Cost Per Student Per Degree

TOTAL UNIVERSITY EXPENDITURES

University/College Level

DIRECT TEACHING

ADMIN

RESEARCH

EXTENSION

Department

Direct Cost Personnel Svcs

Direct Cost Operating

Indirect Cost

Divide by

Divide by

Divide by

Total Units/Year & # Students

# of Enrolled Students

Student Population

DIRECT UNIT COST PER STUDENT (by Subject or Department)

INDIRECT COST/STUDENT

Add Products of all Direct Costs Per Subject/Department

COST PER STUDENT FOR YEAR

Add Direct Costs for Each Year in the Curriculum

COST PER STUDENT PER DEGREE

Source: Santiago, A. et al. (2002), A Comprehensive Cost Analysis of Degree Programs for Selected Higher Educational Institutions (NCR Pilot Study – Phase 1).

Tan (2003) Formula for the Estimation of Cost of Degree Programs at UP

$$\text{Program Cost}_i = \sum_{c=1}^{C} p_c (CSC_{i,c}) + \text{n(AOS}_I) + n(AOCU_{I,c})$$

where i = program *i* in a CU

c = college/unit where a prescribed course originates

p = number of credits required from college *c*

n = number of years to complete program *i*

The variables in the formula are measured as follows:

CSC	=	cost per student credit
	=	total cost of instruction (TCI) divided by total student credits (TSC).
TCI	=	Total cost of instruction = DCI + IDC
DCI	=	Direct Cost of Instruction = Expenditures for Faculty Personnel Services (FPS) x Faculty Load for Instruction/Total Faculty Load or (FLI/FLT) + Maintenance, Operating and Other Expenses (MOOE) for library and laboratory x ratio of FLI/(FLI+FLRE). Recall research and extension (RE) are taken to be separate outputs of the university.
IDC	=	Indirect cost of instruction is all other costs of the college or its budget minus DCI and minus the cost of research and extension (RE). The share of RE in FPS is RE share in faculty load multiplied by FPS and the share of RE in MOOE = FLRE/(FLI+FLRE) x MOOE for library and laboratory .
TSC	=	the weighted sum of student credits of all courses offered by a college. It is the divisor DC and IDC or TCI. Student credits for a course are the number of academic credits assigned to it multiplied by the number of students enrolled in it. Graduate courses are assigned 1.5 the weight of undergraduate courses.
$AOCU_{I,c}$	=	Administrative and other overhead cost of each constituent university (CU). This is directly obtained from the internal operating budget of each CU. The budget document gives the budget for the chancellor's office, medical services and other support services, advanced and higher education, research and extension and others. AOCU is simply the CU administrative and the two support services' budget. The share of instruction in AOCU which is the product of AOCU and the ratio of higher education budget to the budget for programs given in the internal operating budgets of the university. $AOCU_I$ is divided by the weighted enrollment of the CU with .75, 1.0 and 1.5 weights given respectively for basic education (elementary and secondary laboratory school, undergraduate and graduate enrollment.
AOS_I	=	share of instruction per student of the AOS_I is the product of the share of instruction in the budget for programs multiplied by the budget of the Office of the President. AOS_I is divided by the total enrollment of the UP system weighted as above.

Source: E. Tan (2003), Cost of Degree Programs in the University of the Philippines, unpublished manuscript

<div align="right">**Exhibit C**</div>

**Estimate of Replacement Cost of Buildings and Classrooms Used
in Undergraduate Instruction at UP**

Construction cost of a classroom (for 40 students)	P	900,000
Construction cost of toilets, common area, and administrative offices (relative to one classroom)		416,667
Cost of furniture and fixtures (e.g., chairs, whiteboard)		150,000
Total cost	P	1,466,667
Divided by useful life in years		25
Annualized cost	P	58,666.67
Divided by number of classes to be held in the classroom per year*		72
Annualized cost per class	P	814.81
Divided by number of units per class		3
Annualized cost per unit	P	271.60

*24 classes per semester x 3 (2 semesters and 1 summer)

REFERENCES

Altbach, P. (1997), *"Let the Buyer Pay: International Trends in Funding for Higher Education,"* *International Higher Education Newsletter,* 9, Boston College Center for International Higher Education.

http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News09/text9.html

Bernardo, A. (2002), "International Higher Education: Models, Conditions and Issues," Discussion Paper No. 2001-12, Philippine APEC Study Center Network.

Bloom, D. and J. Sevilla (2003), *"Difficulties in Justifying General Public Subsidies for Higher Education in Developing Countries,"* *International Higher Education Newsletter,* 32, Boston College Center for International Higher Education.

http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News32/text001.htm

Bray, M. (1998), *"Financing Higher Education in Asia: Patterns, Trends, and Policies,"* *International Higher Education Newsletter,* 13, Boston College Center for International Higher Education.

http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News13/text6.html

Bray, M. (2002), The Costs and Financing of Education: Trends and Policy Implications, Education in Developing Asia Volume 3 (ADB, Comparative Education Research Center, The University of Hong Kong).

De Guzman, A. (2003*), "*The Dynamics of Educational Reforms in the Philippine Basic and Higher Education Sectors*," Asia Pacific Economic Review,* 4(1), pp. 38-50.

Fanelli, A. (1999), *"The Funding of Higher Education in Argentina"*, *International Higher Education Newsletter,* 14, Boston College Center for International Higher Education. http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News14/text2.html

Johnstone, D. (1998), The Financing and Management of Higher Education: A Status Report on Worldwide Reforms, http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079956815/FinancingMgt_HigherEd.pdf

Marginson, S. (2003), *"High Fee Market for Australian Universities?" International Higher Education Newsletter,* 33, Boston College Center for International Higher Education. http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News33/text010.htm

Santiago, A., G. Largoza, M. Ponce, P. Intal Jr., M. Alba, and C. Rufino (2002), A Comprehensive Cost Analysis of Degree Programs for Selected Higher Educational Institutions (NCR Pilot Study – Phase 1).

http://www.aki.dlsu.edu.ph/publications/working_papers/WB%2012-CHEDFINAL%5B1%5d.pdf

Tan, E. (2003), "Cost of Degree Programs in the University of the Philippines," *unpublished manuscript.*

Tilak, J. (2006), *"Global Trends in Funding Higher Education," International Higher Education Newsletter,* 42, Boston College Center for International Higher Education. http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/Number42/p5_Tilak.htm

West, E. (1995), *"Education With and Without the State", Human Capital Development and Operations Policy Working Paper No. 61.*

http://www.worldbank.org/html/extdr/hnp/hddflash/workp/wp_00061.html

Wolanin, T. (2000), *"Financing Higher Education in the United States: An Overview," International Higher Education Newsletter,* 19, Boston College Center for International Higher Education.

http://www.bc.edu/bc_org/avp/soe/cihe/newsletter/News19/text5.html

World Bank (1994), Higher Education: The Lessons of Experience (WB, Washington, D.C.)

World Bank (2000), Higher Education in Developing Countries: Peril and Promise (WB, Washington, D.C.)

NOTES

[1] Revised as of 12 February 2007

[2] See, for example, Johnstone (1998), Bloom and Sevilla (2003), Altbach (1997), West (1995).

[3] While public HEI spending has nominally increased, it has remained at around 13-14% of the total education budget from 1999 to 2003.

[4] Hereafter, we drop the year of publication and refer to these two studies as "Santiago" and "Tan".

[5] Santiago et al. (2002), p. 9.

[6] The study noted that faculty time is not solely used for instruction and thus faculty compensation (basic salary + benefits + allowances) was apportioned among the major faculty activities of undergraduate and graduate instruction, research, administration, extension services, and others, based on the distribution of faculty load in units among these different activities (see Santiago, Appendix D, p. 64).

[7] Total indirect costs were divided by the entire student population in the study.

[8] It is to be noted that faculty load is a self-reported figure and may not accurately represent the actual distribution of faculty time (and therefore compensation) among the latter's activities.

[9] Tan also proposed that the methodology may be refined by grouping related courses within an academic unit and accumulating/calculating direct costs for these groupings. Santiago had a similar recommendation.

[10] Administrative load is excluded in the calculation as administration is considered as merely supportive of the university's three main functions.

[11] Indirect costs consist of personnel compensation, MOOE, and the annualized cost of facilities.

[12] Conceptually, only the administration costs relating to instruction and research should be included in the cost of instruction. The contribution of research to instruction is more significant and well-accepted than is the contribution of extension to instruction. At present, however, extension activities consume an immaterial amount of university resources and thus need not be excluded for purposes of costing instruction.

[13] As previously discussed, faculty load information will be used to allocate academic unit-level costs among instruction, research and extension. Thus, the direct costs listed here should be understood as referring to amounts allocated for instruction.

[14] The UP's accounting/budgeting cycle is on a calendar year basis, while faculty load and enrolment data are collected on a school year basis. There is no need to reconcile the time periods, as long as one complete year of data is used. For this study, financial figures are for CY 2004, while faculty load and enrolment data are for SY 2004-2005.

[15] The exact ratio is FL(I) ÷ (FL(I)+FL(GI)+FL(R)+FL(E)), where FL = faculty load in credit units, I = undergraduate instruction, GI = graduate instruction, R = research and E = extension

[16] The ratio is FL(I)÷(FL(I)+FL(GI))

[17] In this study, cost of facilities excludes the cost of building and classrooms. In many cases, for both private and public HEIs, the building and the classrooms are donated; thus the cost of such are not passed on to the students. Further, because of the long useful lives of these fixed assets and their heavy usage in UP, their historical cost per undergraduate SCU is minimal. Nevertheless, an estimate of the addition to COI of the *replacement cost* of buildings and classrooms was made for this study. Please see footnote 21.

[18] 'Useful life' is an estimate of the number of years a fixed asset is expected to be operational. It can also be defined as the number of years before the asset is expected to be replaced.

[19] Information on replacement cost of facilities used in undergraduate instruction was collected in connection with a review of UP tuition fees undertaken in 2005.

[20] Faculty and administrative personnel costs are combined for the campuses because these are combined in the IOB. Note that the treatment of these two costs is the same in the estimation.

[21] Annualized facilities cost increases by around P6.79/SCU if the *replacement cost* of buildings and classrooms were included in the calculation (see Exhibit C for the calculation made).

[22] Up until SY 2006-07, the tuition fee per unit in UP Diliman is P300; in UP Manila, P250; and in the regional units, P200.

[23] State Scholarship for All Filipino U.P. Students Through Socialized Tuition Fee and Financial Assistance, Excerpt from the Minutes of the 1018th Meeting of the UP Board of Regents on 28 April 1998 (Exhibit A), p. 1

[24] We assume that the STFAP definition of "full cost" approximates our present definition of direct cost of instruction.